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ABSTRACT

Declining physical conditions of school buildings, overcrowding, and lack of electrical systems to support new technology are rampant in schools throughout the United States, particularly in schools that can least afford to correct these problems. This document addresses the question of why school condition needs to be addressed, the major causes of the current condition of America's schools, the role states can play in funding school facilities, and the alternative mechanisms for funding facilities projects. (GR)

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POLICY Perspectives

NORTHEAST AND ISLANDS REGIONAL EDUCATIONAL LABORATORY AT BROWN UNIVERSITY

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School Facilities

Declining Conditions, Declining Opportunities

Severe overcrowding, combined with crumbling buildings, electrical systems that cannot support technology, and a myriad of other structural problems in many of our nation's schools, has led to renewed attention to designing, constructing, and maintaining school facilities. A series of recent General Accounting Office (GAO) reports commissioned by Congress determined that inadequate school facilities are a widespread problem, with fully one-third of all schools in need of extensive repairs or replacements. According to one of the GAO reports (1995), an estimated $112 billion is needed to bring all of America's schools back to a satisfactory condition. While schools in all areas of the country display infrastructure problems, urban schools with a high proportion of low-income and minority students display more severe need. New York City Schools estimate that $7.8 billion is needed just for repairs. A majority of schools in the northeast region ** report a need for repairs, though the amount of repairs needed to reach good overall conditions varies tremendously. Not surprisingly, those schools with greatest repair needs are in those districts least able to afford them.

School Facilities
Table of Contents

Why address conditions
Causes of current condition
Roles states have played
Funding mechanisms
Conclusion
References
Further resources
Contact information

Return to previous page

TABLE I

State	% schools reporting need to upgrade or repair buildings to good overall condition	reported range of amounts needed to upgrade or repair to good overall condition
CT	77	$600 - $35,000,000
MA	92	$300 - $23,490,000
ME	85	$200 - $16,000,000
NH	87	$250 - $8.500.000

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NY	90	$11,000 - $51,728,000
RI	81	$50 - $8,000,000
VT	82	$100 - $7,573,032

According to one of the GAO reports (1995), an estimated $112 billion is needed to bring all of America's schools back to a satisfactory condition. While schools in all areas of the country display infrastructure problems, urban schools with a high proportion of low-income and minority students display more severe need.

** The GAO study and report produced data from the 50 states only. Facilities-related data from Puerto Rico and the Virgin Islands was unavailable.

Why does the condition of America's schools need to be addressed?

Student Performance

Much like studies of the workplace that have related employee productivity to physical environment, many studies have made the connection between adequate school facilities and academic performance. A study of overcrowded schools in New York City found that students in such schools scored significantly lower on both mathematics and reading exams than did similar students in schools with adequate space (Rivera-Batiz & Marti, 1995). Cash (1993) found that in small, rural Virginia schools, after variations in socioeconomic status had been accounted for, achievement scores were up to five points lower in buildings with low quality ratings. Likewise, Hines' (1996) study of large, urban Virginia schools showed that achievement scores of students were up to eleven points lower in substandard buildings than those of students in adequate facilities. In addition to

presenting tangible, structural impediments to learning, poor school conditions also affect student performance by sending a negative message to children about their worth and the value of education.

The quality of a school's facilities also impacts its ability to support the implementation of education reform. For example, an elementary school in Boston has been unable to meet the "time on learning" requirement of the Massachusetts Education Reform Act due to the nature of its facilities. The school has added space over time, with part of the facility located across a highway, which children traverse via an elevated staircase, Another addition is a block away. Sprawling schools that have been greatly expanded over time are common, and the time students have to spend in transit to different instructional settings disrupts the school day and reduces time that could be spent on learning.

One GAO report (1996) asked schools to report the degree to which the functional requirements of their instructional settings influenced education reform. Table 2 depicts the percentage of schools in the Northeast that reported their facilities as meeting those needs "not well at all."

Health and Safety

Inadequate and neglected facilities present a real threat to children's health and safety. For example, the GAO report found that over half of the schools surveyed reported at least one unsuitable environmental condition, such as poor ventilation or heating and lighting problems. One-third of all schools in Maine, Massachusetts, and Rhode Island report unsatisfactory indoor air quality and nearly one-half of the schools in Massachusetts and New Hampshire report inadequate ventilation. In addition, one-third of the schools in Rhode Island and nearly half the schools in Connecticut anticipate above average spending in the next three years in order to remove asbestos from schools in compliance with federal regulations.

Overcrowding

A record 51.7 million students occupy the nation's public and private schools, with approximately three million

more expected in the next decade. As a result, many of the nation's schools are severely overcrowded. The U.S. Department of Education estimates an expenditure of over $60 billion will be necessary over the next ten years in order to construct more than 6,000 additional schools to alleviate the overcrowded conditions.

TABLE 2

% of school facilities categorized as meeting functional requirements related to education reform "not well at all"

State	library/ media ctr.	small group instruction	teacher planning	large group instruction	laboratory science	before/after school care
CT	13	5	11	34	44	54
MA	24	13	13	40	49	62
ME	25	17	14	43	59	88
NH	21	14	28	49	47	61
NY	22	18	17	45	46	52
RI	26	11	15	43	46	63
VT	14	10	22	41	39	55

A study of overcrowded schools in New York City found that students in such schools scored significantly lower on both mathematics and reading exams than did similar students in schools with adequate space.

Although the northeast region is not experiencing the same rapid growth that other areas of the country are, many schools in the Northeast have been overcrowded for a longer period of time. Even in Maine, where enrollment is projected to decline, overcrowding is a problem in some areas. [See Table 3 below.] One community school in Maine has been, since 1987, annually delaying a proposed school expansion due to lack of funds. As a result, the number of portable classrooms in use at the school now exceeds the number of permanent classrooms inside the main school building.

Future Cost Consideration

Facilities planning, construction, and renovation must be approached as an opportunity for strategic investment, not as processes that provides quick-fixes. Evidence suggests that failure to pay for adequate school facilities now will only create a greater cost burden in the future because the cost of renovation and further construction of schools will continue to increase (Picot, 1994). For example, a typical roof repair for an aging New York City school building averages $600; a full roof replacement averages $300,000. Deferring maintenance not only creates a backlog of repair costs, but can cause related conditions to decay more rapidly. Delaying roof repairs can lead to damage to plumbing and electrical systems, internal ceiling tiles, walls, floors, and furniture.

TABLE 3

The National Center for Education Statistics projects the following changes in public school enrollment in the northeast between 1993 and the year 2000.

(U.S Department of Education, 1995)

CT	MA	ME	NH	NY	RI	VT
+8.9%	+7.9%	-1.8%	+6.5%	+7.4%	+6.9%	+2.0%

What are the major causes of the current condition of America's schools?

In part, it's a matter of timing. About 31% of the nation's schools are the familiar post-World War II brick fortresses built to last fifty years or more. An additional 50% of schools were constructed as quickly and inexpensively as possible during the enrollment growth spurts of the 1950s and 1960s. These schools were only intended to last twenty to thirty years. As a result, the majority of our nation's schools are at or near the end of their intended lifespan. Obsolescence, as well as the inability of aging facilities to serve current educational needs, contributes to the current crisis.

The major reason, however, for the inadequate condition

of so many of America's schools is the deferral of maintenance and construction due to inadequate funding. As districts experience shrinking budgets and increased demands, deferring facilities-related spending becomes a common way to cut costs. In addition, there is less willingness on the part of the taxpaying community to bear facilities costs.

The Problem with Facilities Funding

The majority of facilities costs are funded the way they have been for a century -- by local issuance of general obligations bonds that require voter approval. However, voter willingness to pass bond referenda has sharply declined in recent years. The Bond Buyer, a newsletter covering the bond industry, reports that "voters in 1994 approved $19.1 billion in school bonds, down from $39.8 billion in 1992" (Zempel, in NEKIA, 1997). There are three main reasons for this decrease:

1. Public resentment has grown against the tax burden that bond sales impose.
2. Communities are placing a higher priority on balanced budgets than on capital debt.
3. Communities have increasing numbers of households without children and populations are increasingly mobile, two factors which make it difficult for communities to commit to a school's future.

In property-tax reliant states, where poorer communities with property assessed at lower values must tax themselves at greater rates to achieve the same levels of funding commitment as communities with higher property values, funding discrepancies are particularly problematic. In fact, reliance on property taxes for capital expenditures -- leading to inequities in the quality of school facilities -- has been the basis for a number of state supreme court rulings that have found state education systems to be unconstitutional.

> *The major reason for the inadequate condition of so many of America's schools is the deferral of maintenance and construction due to inadequate funding.*

What role have states played in funding school facilities?

Although school facilities funding is traditionally a local responsibility, states have used two mechanisms to increase incentives for local voters to pass bond issues and to decrease funding disparities between districts.

The first mechanism, debt service, is a process whereby the state offers grant money to help defer the cost of paying interest on the bond. This grant is usually contingent upon passing a referendum, and the mechanism is therefore aimed at creating an incentive for local voters to pass the bond issue in order to take advantage of the state funds.

The second mechanism is direct state funding of construction costs. Both mechanisms - debt service or direct funds - are usually granted in varyiñg amounts, depending on local ability to pay and other state priorities. For example, New Hampshire contributes 30-55% of its funds toward debt service of approved projects (with a priority placed on districts that are consolidating), or toward construction/renovation projects related to establishing kindergarten programs.

Massachusetts' program pays a portion of debt service and direct costs for approved projects that fall under two categories: 1) districts seeking to correct racial imbalance in schools; and 2) districts seeking to reduce overcrowding or to "enable provision of a full range of education programs needed to maintain full accreditation" (MA Department of Education, 1996). But in these and other states, demand from approved projects exceeds appropriated state funds, resulting in a backlog of projects.

In Maine, 83 facilities projects have requested state aid for fiscal year 1998, and the $65.8 million authorized by the state is expected to cover only the four neediest projects. New York has a statewide backlog of more than $15 billion.

Vermont is experiencing a serious backlog of facilities projects since the 1996 repeal of their unusual school construction law. Previously, Vermont awarded construction aid for any approved project. Projects were funded on a first-come, first-served basis, with the state picking up between 30-50% of the costs and up to 70% of the debt service. While the "guarantee" program only

cost Vermont about $9 million annually in the late 1980s, demand for new schools due to increased enrollment began to rise sharply in the early 1990s. By 1995, the $28 million in construction/renovation requested by approved projects exceeded the appropriations by $10 million.

For the most part, state aid earmarked for school facilities comprises a very small percentage of local budgets. While state aid for facilities is often granted on a sliding scale, based at least partly on need, many argue that it is insufficient to offset disparities in property wealth. In compliance with state supreme court rulings, states such as Arizona and Ohio have used state funds to equalize disparities in the ability to finance capital expenditures between property-rich and property-poor districts. But their efforts have also been met with severe protests from property-rich communities, who are resentful that their tax dollars are being used for school facilities in other communities.

It is unlikely that increased state aid alone is an adequate solution. Federal aid may not be immediately forthcoming either. During the first session of the 105th Congress, the Partnership to Rebuild America's Schools Act was introduced. The Act proposed $20 billion in facilities funding over the next four years, half of which would have been earmarked for the nation's 100 highest-poverty districts. But like the funding dilemma faced by local districts, Congress deferred attention to school maintenance in favor of other education budget priorities.

What are alternative mechanisms for funding facilities projects?

Local school districts are seeking creative mechanisms for funding facilities that can provide alternatives to the traditional voter-approved bond referenda or can supplement current sources. A recent report from the National Education Knowledge Industry Association (NEKIA, 1997) highlights several alternatives:

- **Lease/Purchase Agreements**
  A "rent-to-own" mechanism allows a school district to purchase a certificate of participation over a number of installments. While the payments are being made, the district essentially leases the property, much like lease payments on a car. After all the payments are made, the district owns the property.

- **Business/Community Partnerships**
  Some communities have gained significant facilities investment from large corporations because they have a vested interest in improving the school facilities that their current or potential employees' children attend. Schools have also formed partnerships with office building owners who receive tax relief in return for dedicating all or part of their space to classrooms.
- **Revolving Funds**
  This proposed mechanism would involve federal loans that could be borrowed at little or no interest and require no voter approval. This type of funding could be particularly appropriate for urgent repair needs and is similar to the emergency funds available for repairing roads and bridges.
- **Impact Fees**
  Some communities propose imposing a surcharge on developers in order to accommodate the influx of new residents, much like fees assessed for new streets and sewers.

Whatever means districts employ to finance school facilities, it is important to ensure that the money is well spent. Careful, informed, inclusive planning is essential. Often, little dialogue exists between the policymakers who fund and approve facilities projects, the architects who plan the facilities, and the educators, students, parents and community members who will be served by the school. More inclusive planning not only increases the likelihood of meeting a greater range of needs, it can also increase the likelihood of financial support for facilities by helping community members understand the necessity of the project and become invested in it.

In the past, much of the dialogue about school facilities was directed toward finding the cheapest way to construct or renovate schools. Now, many communities are experiencing the problems of cheaply-built schools. Others are experiencing the limitations of traditional, inflexible floor plans and classroom space, of schools with electrical systems that cannot support classroom technology, and of other structural limitations which inhibit teaching and learning.

Dialogue about school facilities planning and design is becoming more creative, attempting to foresee future needs, taking into account the community in which the school exists, and, most importantly, considering what is needed to best support student learning. Following are

some of the design features that are most important to new and renovating schools today:

- Professional space for teachers to confer with colleagues and engage in professional development activities
- Student work space that is flexible enough to enable group work and yet provides quiet spaces for individual work
- Smaller scale learning environments, such as "houses" or "clusters" that create more personalized, interactive learning communities and can even exist within very large schools
- Fluid traffic patterns that ensure the smooth transition of students from one learning environment to another
- Integrated technology that ensures that students encounter and use technology as a pervasive tool to enhance their learning
- Flexible space that can accommodate changing needs (such as day-care and community functions) and can also accommodate rapidly changing technologies
- Equal routes of access to and within school facilities for students with differing physical abilities
- Greater incorporation of natural light, which has been shown to enhance student attention span and can improve efficiency
- Exterior and interior designs reflective of the cultural diversity of the community

> *School facilities planning and design is becoming more creative... considering what is needed to best support student learning.*

Conclusion and Next Steps

With all that is already known and being learned about the effect of school facilities on student learning, health, and overall well-being, policymakers can no longer afford to defer or delay attention to ensuring adequate school facilities for all children. Policymakers, administrators, educators, and community members need to continuously revisit and reevaluate their facilities with the following questions in mind:

- How well do current school facilities support safe, effective teaching and learning? What are the current means of assessing and documenting the facilities' performance and effectiveness?
- What are the current processes of planning for facilities renovation/construction? Does that planning take into consideration the latest knowledge about design elements that enhance teaching and learning and about the structural features that support current and future technology?
- Do current facilities assessment, design, and planning processes involve educators, parents, and students?
- Do current methods of funding facilities renovation/construction increase the disparities between schools or districts with differing economic means? Are other, more equitable means for financing school facilities available or being explored?
- What type of improvements in teaching and learning are being planned? What type of facilities will be necessary to house and support them?

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Further Resources

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Organizations

- The Children's Environments Research Group at City University of New York (CUNY). (212)642-2970. The Children, Youth and Environments Network, also at CUNY, operates a listserv. To subscribe, send an email to: listserv@cunyvms.1.gc.cuny.edu
- The Council for Educational Facility Planners International. CEFPI hosts an annual conference, publishes a bimonthly journal and other publications, conducts research, and offers technical assistance to educators on planning, design, renovation, and construction of school facilities. (602)948-2337
- The New American School Design Project serves educators and architects through reports, design models, technical support, and an annual conference. (617)253-8993

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Back to previous page